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EDP - the making of a global *Green* Brand

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EDP - the making of a global *Green* Brand

Abstract

As of 2007, EDP, operating as a non-state owned company, decided to take a serious and assertive position in the renewable energy sector, as it confirmed to be an emergent industry. Partially owned by EDP, EDP Renováveis was the relevant player in charge of integrating the Portuguese Group in this sector, thus internationalizing its name and reputation. This case analyses EDP's penetration and expansion strategy, taking into account the opportunities and threats faced by the renewable energy sector.

Keywords:

EDP;
Renewable Energies;
Growth;
Internationalization.

EDP - the making of a global *Green* Brand

Introduction

It was an April's day of 2009 and António Mexia, EDP's Chairman, was expecting the remaining executive board members to start the scheduled meeting¹, with the purpose of discussing how to accomplish EDP's Strategic Plan 2009-2012². When the last board member arrived, the conditions were met for the meeting to begin. The first intervenient, António Pita de Abreu, an experienced executive, opened with a presentation of EDP's history and sector activities.

Background: EDP - Energias de Portugal

EDP was born in 1976 resulting from the nationalization and merger of various small firms in the electricity sector, becoming immediately the leading firm in the Portuguese electricity market.

After a deep restructuring in 1994, EDP entered its first privatization phase in 1997 with a sale of 29.5% stake. Five new privatization phases followed, until it reached the current profile, in which 79% of its capital is non-state owned.

Nowadays EDP's operating units (excluding EDP Renováveis) consist of generation, distribution and supply of electricity in Portugal and Spain (See *Exhibit 3*), making it the third biggest operator in Iberia with 18,824 MW of electricity gross installed capacity (See *Exhibit 1*). Also in Iberia, EDP Group has a significant position in the gas market as well, being the

¹ This is a hypothetical meeting

² See Exhibit 18

second largest operator in this region. Beyond Iberian borders, the group is present in the Brazilian electricity market, as a supplier, distributor and seller through EDP – Energias do Brazil.

With the climb of environmental concerns leading to the international environmental treaty produced at the United Nations Conference in 1992, the renewable energy sector started to attract considerable investment. Seeing an opportunity, in 1996 EDP makes its first move into the renewable sector with the foundation of Enernova. Its purpose was to develop and explore wind projects in Portugal, having started with an installed capacity of 10MW. As the renewable sector gained importance to EDP, the group started to act more aggressively in the field. In 2002, EDP acquires 80% of the Spanish renewable utility Genesa (Caja Madrid retained the remained 20%), reaching 530 MW in 2004.

With the purpose of holding and expanding the Group's renewable business across Europe, EDP created NEO Energia, which integrated Enernova's and Genesa's wind projects, and, at the end of 2005, acquired the Spanish assets of Nuon, which added 1,490 MW of wind generation capacity. These investments contributed to the continuation of portfolio diffusion across Spain and later the expansion into the French, Belgian and Romanian market.

With the intention of becoming one of the largest players in the renewable sector, in June of 2007 EDP fully acquired the North American leader in the development, management and exploitation of wind farms in the United States - Horizon Wind Energy.

The Portuguese energy sector activities and integration

The Portuguese energy sector went through a deep restructuring during 2006 as a result of the "Electricity Directive" implementation by the European Council, which defined new strategic guidelines, including diversification of energy sources in the Portuguese energy supply, to control the environmental impact at national and global levels. Additionally, the Directive also aimed to stimulate the competition in the electricity market. As of 2008, the

National Electricity System (Sistema Eléctrico Nacional, “SEN”) encompassed four major functions: **generation**, **transmission**, **distribution** and **supply**. These functions operated independently from one another, from a legal, organizational and decision-making viewpoint.

The first function is fully open to competition and to operate, each producer has to acquire the respective licenses and approvals. This activity, not including EDP Renováveis, was managed by several companies in which EDP had full or great part of its control (*Exhibit 3*). The electricity generation was divided into two regimes: *Ordinary Regime Generation*³, and *Special Regime Generation*⁴, being that the latter benefited from special tariffs.

The **electricity transmission** was taking place in the *National Transmission Grid* (Rede Nacional de Transporte) through a concession approved by the Portuguese state to REN (Rede Eléctrica Nacional S.A.). The electricity was “transported” by the generating facilities to the *National Distribution Grid*, consisting of a medium and high voltage network, and through low voltage distribution grids. Presently, the exclusive concession for the activity of **electricity distribution** on high and medium voltage has been awarded to EDP Distribuição, whose activity is fully regulated by the *Entidade Reguladora de Serviços Energéticos* (“ERSE”)⁵. The low voltage distribution grids were operating under concession agreements granted to the municipalities⁶.

The **electricity supply** activity was open to competition, subject only to a licensing rule. Under market conditions, consumers were free to choose their supplier, without any additional fees in case of switching providers. The electricity could be sold under the regulated or the free market. EDP Serviço Universal, with 70% of the whole Portuguese market, was the Portuguese supplier in the regulated market, where the electricity was sold under a tariff structure defined by ERSE. EDP Serviço Universal was nominated by EDP Distribuição and local low voltage distribution concessionaires as the “last recourse supplier”, meaning that it

³ The electricity is produced through traditional non-renewable sources and large hydroelectric plants

⁴ The electricity is produced through alternative renewable sources.

⁵ Entidade Reguladora de Serviços Energéticos (Portugal)

⁶ Source: Preliminary Offering of EDP Renováveis

was responsible for the purchase of all the electricity produced by Special Regime Generators.

EDP Comercial, another Portuguese subsidiary of the Group, operates in the free market, in which it competes with other Iberian suppliers, and whose prices are easily adjusted.

During the presentation, the chairman interrupted António Pita de Abreu to purposely emphasize the importance of the ongoing investment in the renewable sector, as “reducing the CO2 emissions was more an opportunity than a cost”.

Energy in a world perspective

The extraordinary rise in the prices of conventional energy raw materials (oil, gas and coal) is definitely one of the reasons why the first decade of 21st century will be remembered. During 2008, the price of the traditional energy sources suffered huge oscillations, and the effects of this unstable scenario were felt in the energy sector all over the world, raising, consequentially, production costs. In addition, with the increase of environmental awareness reflected into new legislation, the price of CO2 allowances rose significantly. These circumstances allowed the boost of investments in new forms of sustainable energy generation capacity based on non-polluting and naturally replenished sources, whose power capacity expanded to 280,000 MW in 2008, a 75% increase compared to 2004 levels. The countries that most contributed to this boost were China with 76,000 MW added, the US with 40,000 MW, Germany with 34,000 MW, Spain with 22,000 MW, India with 13,000 MW, and Japan with 8,000 MW (See *Exhibit 5*). Wind was the main contributor for the enlargement of the worldwide renewable capacity, having reached in 2008 a total of 121,118 MW (See *Exhibit 6*). In the US, the construction of wind capacity, boosted by the supporting legal mechanisms, made the US the world's leading country in wind-power with 25,170 MW by the end of 2008. Still, Europe was the continent with the highest level of wind installed capacity (66,000 MW) (Germany, Spain and Denmark aggregate 43% of the world-installed capacity). In Asia, China

was preparing itself to achieve the second place in terms of wind installed capacity in the coming years, overtaking Germany and Spain that currently occupy the second and the third place, respectively (See *Exhibit 7*).

These subsequent increments of wind capacity, was turning wind into the future's world major renewable power source for energy. The wind turbines operating worldwide by the end of 2008 were generating 12% of the global electricity consumption, and the Global Wind Energy Council (GWEC) estimated that the wind sector would increase its world installed capacity to 332,000 MW by the end of 2013, an enlargement of 175% from 2008 levels⁷.

As the Chairman's speech ceases, Ana Maria Fernandes, the recent Vice-Chairman of EDP, began her presentation by mentioning the governmental programs that were sustaining the development of renewable energies in the markets where EDP was operating at the time.

Regulatory Framework

The threat of global rising temperature forced the world economies to make an effort to effectively control greenhouse emissions. A scenario of increased societal and governmental attention towards the reduction of CO₂ emissions triggered the emergence of a makeover in the energy mix. As the electricity generated by renewable sources is environmentally harmless, governmental initiatives started to emerge worldwide, focusing their legal policies on the creation of a set of legislative measures to incentivize and increment the share and efficiency of renewable energy sources, reducing the global dependence on fossil fuels energy generation.

Europe

On May 9, 1992, 154 countries signed the United Nations' Framework Convention on Climate Change (the "UNFCCC"), which came into effect on March 1994. The objective of the UNFCCC was to "*achieve stabilization of greenhouse gas concentrations in the atmosphere at*

⁷ World Wind Energy Association Report, 2008

*a level that would prevent dangerous anthropogenic interference with the climate system*⁸.

Three years later, on December 11, 1997, the majority of the UNFCCC country-members also ratified the Kyoto Protocol. This agreement was implemented on February 16, 2005 defining, for each country, mandatory limits on carbon dioxide emissions, in an effort to reduce global emissions of at least 5% in the period between 2008 and 2012.

Following the Kyoto Protocol, the *Renewable Energy Road Map* (20/20/20 goals) was presented by the EU Commission in 2007. This integrated package defined ambitious goals: the reduction of greenhouse gas emissions by 20% from 1991 levels, the increase of the share of renewable energies to 20% of total energy consumed and the boost of energy efficiency by 20% until 2020. The package also obliges the electricity sector, among others, to reduce CO2 emissions by 21% from 2005 levels.

Albeit EU shares a common target, each country-member has its own way in supporting the renewable energy program internally. The *Fixed Tariffs* (used in Portugal and France), *Power Purchase Agreements (PPA)* (used in Belgium), *Pool Price plus a Premium* (used in Belgium, and Spain) and *Tax Incentives* are applied by the European countries to achieve the proposed objectives (See Exhibit 9).

United States

The US government created its own means to incentivize and sustain the investment in *green technologies*. Alternatively to the Kyoto Protocol that this country never ratified, the US government adopted the *Production Tax Credits (PTC)*, *Modified Accelerated Cost Recovery System (MACRS)* and *Renewable Portfolio Standards (RPS)* (See Exhibit 10). Furthermore, the *American Recovery and Reinvestment Act* of 2009 set challenging goals for the renewable sector, enhancing its growth potential; given the insufficient interconnections between wind farms and urban areas, the US government allocated more than \$60 billion in clean energy

⁸ United Nations' Framework Convention on Climate Change's website: www.unfccc.int

investments, from which \$11 billion should be spent in the improvement of electric grid connections.

After capturing the audience's attention to the opportunities that the market was reserving to sustainably reinforce the investments in the renewable sector, Ana Fernandes proceeded by briefly presenting EDP Renováveis and emphasize its great performance and contribution for the Group. "Keeping a low risk profile with high returns, increasing gains of efficiency and keeping CO2 emissions in low levels, are part of the Strategic Plan. The main contributor for the accomplishment for these goals is definitely EDP Renováveis", the Vice-Chairman said.

EDP becoming a global player

On December 4, 2007, EDP Renováveis was created with the purpose of concentrating and operating EDP's growing European and North American renewable assets and activities. In 2008, EDP Renováveis was held by EDP S.A. (62.02%), Hidrocantábrico (15.51%) and the rest was sold in stake (22.47%). As of year-end 2008, EDP Renováveis hold 5,063 MW of gross installed capacity, composed essentially by onshore-wind and, to a very limited extend, mini-hydro⁹.

In the same year, EDP Renováveis was operating and developing its activities in a multiplicity of geographies in Europe (Portugal, Spain, France, Belgium and Romania), North America (United States) and South America (Brazil) (See Exhibit 11). The European operations were being managed by NEO Energia, (EDP Renováveis EU), which aggregated 58% of EDP Renováveis' installed capacity (2,905 MW) (See Exhibit 11.1). The North American's platform, Horizon Wind Energy (EDP Renováveis NA), hold 2,158 MW of gross installed capacity spread over 8 states, which totaled 42% of company's generating capacity. In addition, Horizon had by the end of 2008, several under construction wind projects in different stages of

⁹ "Gross installed capacity is the aggregate capacity, calculated by including 100% of ownership of the asset" (World Wind Energy Association, Report 2008)

development, as the US subsidiary expansion was largely driven by “organic growth” rather than by wind projects acquisition.

Beginning the year of 2008 with a different management brought a brand new dynamism to EDP Renováveis, and a series of acquisitions took place; its European portfolio was incremented with the acquisition of French wind assets and by entering the Romanian market. The company was about to begin operations in Brazil and, in the US, EDP Renováveis integrated Hydra Energy’s wind projects into its wind portfolio (See *Exhibit 13*).

With all this fulminate growth and dispersion, EDP Renováveis had, by the end of 2008, enlarged its gross installed capacity in 5.3 times versus 2005 (See *Exhibit 12*). In fact, in addition to the already under construction capacity, EDP Renováveis has numerous other projects at different stages of development. Concerning capacity additions, the company forecasted in its 2008 Annual Report that its capacity growth-rate would round 20% for the coming years, which is projected to represent approximately 35% of the world’s expected total growth in wind capacity in the 2007-2015 period¹⁰. Actually, EDP Renováveis was experiencing extraordinary capacity growth rates, (See Exhibit 4.1.2) mainly driven by the wind capacity additions in Spain and in the US (See Exhibit 4.1.2.1). As this was accompanied by an increase of 19% in average tariffs and an ever-increasing efficiency at the operational level, namely through escalating and consistently above the average load factors, the company’s output outgrew its capacity, (See Exhibit 4.1.2.2), which was reflected in its attractive and growing margins and ultimately in an astonishing doubling of its EBITDA (See Exhibit 4.3)¹¹. The latter has not only been growing in absolute terms, it is actually gaining weight in the Group’s EBITDA when comparing to the other Group’s business (See Exhibit 4.3.1). In effect, realizing the growth opportunity, this capacity expansion represented, at the end of 2008, a staggering 2/3 of the Group’s CAPEX (See Exhibit 4.4), a figure to be maintained in the years that follow according to EDP’s mid-term future perspectives

¹⁰ Global Wind Energy Council

¹¹ “The load factor of an energy technology is the ratio of the net amount of electricity generated by a power plant to the net amount which it could have generated if it were operating at its net output capacity.” (British Wind Energy Association, Report 2009)

stated in the its Strategic Plan 2009-2012, as EDP Renováveis' generation capacity was expected to reach 10,500 MW in 2012. This challenging goal was projected to enable the company to almost double its parcel in the Group's EBITDA (See Exhibit 4.3.1).

The audience started to seem convinced that continue investing in the renewable is the smartest movement that EDP could make. The internationalization by means of the renewable sector was proving to be one of the key success factors of EDP, as it helped to guarantee the efficiency gains when analyzing new market opportunities, and more important, it was bringing EDP's name and brand to the world through a noble cause. Suddenly, the financial subject was raised by one of the members, which brought the CFO Nuno Alves to present EDP Renováveis' financial strategy and hedging policies that would continuously improve the Group's capital structure.

Financing wind projects

Wind farm development is a capital-intensive industry and, thus, requires enormous amounts of capital financing. Hence, to finance its wind projects, EDP Renováveis made use of several means, namely issuance of equity, institutional partnerships, and shareholder and non-shareholder loans.

At the beginning of 2008, EDP Renováveis entered into a \$600 million Institutional Investors partnership in the US, with Wachovia Investment Holdings and GE Energy Financial Services, to finance 2007 and 2008 wind projects. Additionally, to strengthening this financing, EDP Renováveis issued €1.6 billion stock in June of 2008. By the end of the year, in order to finance new wind farm projects, the company felt the need to establish a new Investors Partnership with JP Morgan Capital Co and New York Life Insurance Group, which raised \$265 million for the Portuguese renewable operator. The institutional partners contributed generally with about half of the required investment, hence receiving an agreed IRR¹². Additionally, by the end of the year, EDP provided a shareholder loan to its subsidiary, who borrowed 1.5 billion at a fixed interest rate of 5%.

¹² IRR (Internal interest-rate) generally around 6%

Knowing how the company financed its wind plants, the executive lawyer Diogo Machado seemed to be worried about the possibility of having troubles in guaranteeing the availability of assets to support the expansion, and highlighted the danger of having the in-development pipeline built by low-performance turbines. Ana Fernandes soothed her colleague by explaining the supplier procurement strategy of EDP Renováveis, aiming to point out its contribution to the accomplishment of a “Greater Efficiency”.

Suppliers

The profitability of this industry highly depended on the effectiveness of the equipment, and, as so, it was crucial that the renewable companies operated with first class assets.

As the incentives to invest in the sector appeared to continue, it was expected that the worldwide demand for turbines might exceed production capacity, as there were only a limited number of wind turbine suppliers. To protect itself from this probable situation, EDP Renováveis shifted from national and project-driven contracts, to long-term and flexible agreements covering several regions, which enabled EDP Renováveis to have wind turbines available when needed. Moreover, the company diversified its suppliers’ portfolio (See *Exhibit 14*) to a mixture of top tier turbine large suppliers, which was allowing the company to get the better purchase conditions and avoid technological problems of each turbine supplier. Additionally, to circumvent problems related to low-performance turbines, EDP Renováveis signed with those turbine suppliers, a 5-year meticulous O&M contracts during the warranty period¹³.

The wind electricity output’s total costs were mostly associated with the foundation of wind turbines, electrical equipment, grid connection, etc¹⁴. These costs represented almost 75% of total capital expenditures (CAPEX) of EDP Renováveis, which were mostly driven by raw

¹³ O&M stands for Operation and Maintenance

¹⁴ European Wind Energy Association, March 2009

material prices¹⁵. Consequently, the constant rise in turbine raw materials' prices, led to a compounded annual growth rate of 7% in CAPEX costs between 2005 and 2008. Additionally, the economic downturn and credit constraints felt in the last years of the first decade of 21st century, led to a contraction of demand for wind turbines. Thus, the industry's dynamics changed, lowering the wind turbines' equilibrium prices, which would only be noticed at the end of the existing contracts. For this reason, by the end of 2008, EDP Renováveis renegotiated suppliers' agreements and more flexible contracts for the next years.

At the moment it was already patent that the international expansion through risk hedging strategies was bringing high value for the company. The Vice-Chairman proceeded by pointing out the market price approach and the competing interactions faced by EDP Renováveis.

Electricity Generation and Sales

The wind energy production was highly influenced by regulation and all the electricity produced by this source is mandatorily purchased by the system in every market where EDP Renováveis operated. The purchase of the electricity output could be made either by regulated prices (fixed-tariff or market price plus premiums) or by non-regulated prices indexed to electricity market prices. In the case of EDP Renováveis NA, most prices were fixed and determined by long-term PPAs¹⁶, by 2008. In the case of Spain, electricity was sold directly on the daily market at spot prices plus a premium, but before entering 2009, the company closed a hedge to avoid pool price oscillations in Spain. In the remaining countries, prices were mainly determined through regulated tariffs or through long-term PPAs.

¹⁵ Raw materials: concrete, steel, aluminum, glass-fiber-reinforced plastic and copper

¹⁶ PPA stands for Power Purchase Agreement (See Exhibits 9 and 10)

Competitive landscape

With all the fulminate expansion that EDP Renováveis experienced ever since it was founded, the Portuguese company was ranked in 2008 as the third largest world renewable operator in terms of net installed capacity, right after **Iberdrola Renovables**, and **NextEra Energy Resources** (See *Exhibit 15*)¹⁷. EDP continued to analyze new opportunities within the markets it operated in as a renewable player, which brought the company to be also ranked, in the same year, as third in terms of net installed capacity in the European market (See *Exhibit 16*), after **Iberdrola Renovables** and **Acciona**.

Also in the US, where EDP was establishing a solid and spread presence, EDP Renováveis was considered in 2008 the number four in terms of net installed capacity, where its wind capacity grew 64% between 2007 and 2008 (See *Exhibit 17*).

Competition dynamics

Wind farms were subject to specific regulations relating to the development and construction of power plants. Among other things, local authorities regulated land acquisitions, building, environmental permits and distribution network congestions. Even with all the regulatory support to the renewable sector, there were some constraints that the renewable firms were facing throughout their business expansion. Given the dynamics of the renewable energies' industry, one might say that the competing interaction occurred mainly in the projects' development phase, mostly in the detection of suitable sites with wind resource abundance, land availability and electricity grid interconnection, which had capacity limitations. To achieve significant market share, first movers had privileged access to existing electricity grid interconnections and were able to choose better wind locations. In less mature and high growth markets the absence of spread grid capacity reinforced the "early mover" advantages possessed by many local developers. To offset these local developers' advantages, large

¹⁷ "Net installed capacity represents the aggregate capacity in which the company has an interest proportional to its ownership. It is calculated by multiplying the company's percentage ownership by the total capacity in each wind farm" (World Wind Energy Association, Report 2008)

players made use of their technical competencies, purchasing capabilities and sales arrangements benefits with its suppliers. Additionally, project financing was always facilitated to bigger and sustainable enterprises.

As the meeting was about to end, it was already consensual that EDP Renováveis was able to guarantee its supremacy position in the markets where it operated, mainly driven by its proven capability to attract investment, proactively manage of its business and risk hedging strategies, execute projects, and deliver targets. Hence, the whole board agreed that EDP Renováveis was definitely the key for the achievement of EDP's Strategic Plan's results, as it enables to cover all the proposed challenges. The Chairman closed the meeting with an overview of the renewable' industry future perspectives, namely for wind, as it was the major investment of EDP Renováveis.

Future perspectives of the renewable energies' industry

In a political context marked by an increasing desire for energy independence alongside with a rising awareness for environmental concerns, renewable energies were expected to play an ever-greater role. Indeed, not only have governments been increasingly supporting renewable energies activities until then, they were expected to continue and boost these supporting efforts in the future, as it was attested by Europe's 20/20/20 binding agreement and, more recently by the Copenhagen Accord. The latter, despite its non-binding nature and being far less ambitious than expected, comprised a commitment for all countries to limit global temperature rise to below two degrees Celsius, backed by money (\$30 billion) and the means to deliver it. In addition, a new world climate summit was scheduled for the end of 2010 in Mexico City for further negotiations.

As for wind energy, based on the experience and growth rates of the past years, the World Wind Energy Association (WWEA) estimated in its 2008's Status Report, that wind would continue its dynamic development in the coming years by attracting more investors due to its

low risk character. In fact, wind, as a pollution free, sustainable and cost-efficient form of energy with a relatively short time-to-market¹⁸ (1-3 years), has proven to be the closest to fossil fuels in terms of competitiveness.

Nevertheless, an argument can be made for the threat of other types of energy source, namely carbon-free technologies such as nuclear and hydrogen. The first is a readily available technology, presenting a huge efficiency level at production, thus making possible to generate a high amount of electrical energy in one single plant. In 2008, the worldwide operating reactors totaled 370,000 MW providing about 2% of the world's energy. Still, due to its somewhat dangerous and potentially problematic nature, especially of its waste, alongside with extremely high construction costs and large time-to-market (app.10 years), *"Even if Finland and France each builds a reactor or two, China goes for an additional 20 plants and Japan, Korea or Eastern Europe add a few units, the overall worldwide trend will most likely be downwards over the next two decades."*¹⁹.

As far as hydrogen is concerned, despite being able to maintain a very stable production as it does not depend on weather conditions, having the ability to generate a high amount of electrical energy in one single plant and having much lower CAPEX and O&M expenses when compared to other technologies, it is based on the untrue premise that hydrogen is readily available. Although, hydrogen may be the most common element in nature, it is always associated with other elements and as so it is necessary to expend a huge amount of energy to separate them to get just hydrogen. This fact makes the final production of energy lower than it would be ideal, being, thus far a quite inefficient process.

¹⁸ "The length it takes from the time that the capacity starts being built until its output is available for sale." (World Wind Energy Association, 2008)

¹⁹ "The World Nuclear Industry Status Report 2009"



Universidade Nova de Lisboa

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Teaching Note

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Proposed Questions

The following questions have the purpose of helping teachers to explore the potentialities of the business case.

- 1- *Describe EDP's growth and internationalization strategy after 1996.*
- 2- *Why is the Renewable Energy industry so profitable for EDP?*
- 3- *Given EDP's growth and expansion strategy, what are the main threats that the company faces and what can EDP Renováveis do to deal with?*
- 4- *Given the perspectives for the development of this industry, how should EDP position itself for the future?*

1- Describe EDP's growth and internationalization strategy after 1996

The rise of regulatory incentives to invest in the renewable sector brought EDP to diversify its electricity generation portfolio and enter the renewable business, which was proving to be very attractive and potentially profitable.

EDP's first step into the renewable sector was in 1996 with the creation of a new subsidiary, aiming at developing and exploring wind energy projects, primarily in Portugal. As the regulatory incentives continue to appear, EDP decided to start its internationalization process, as a way to expand sales, acquire resources, minimize the business risk, expand its business portfolio and extend its competencies as a renewable player. EDP's first international move as a renewable player was to Spain. This move was made by means of a direct investment (acquisition of 80% of Genesa) mainly since EDP already had a strong position in the Spanish electricity market, and possibly due to deep similarities between both Iberian countries, in terms of cultural and geographical/climatic factors, as the latter plays a significant role in the output volume production. Also critical in this choice were the regulatory framework, as it determines the pricing advantages, volume sales and market share. Focusing on continuously expanding the renewable business, EDP decided to aggregate Enernova and Genesa in a new subsidiary, NEO Energia. The new management went on with the expansion in the Spanish market, and later on into France, Belgium and Romania. These last moves were already made through a new company, EDP Renováveis that jointly manages the European's and the acquired North American's platforms (Horizon Wind Energy) in 2007.

The entry into a different continent enabled the Portuguese utility to minimize business risk, as the US is a completely different market in terms of geographical, climatic, political and legal matters. The decision to enter in the Brazilian market through a *portfolio investment* would be made for the same reason, besides the fact that EDP was already a relevant player in the Brazilian's electricity market.

The internationalization strategy of EDP has been mostly made by incrementing renewable energy capacity (See Exhibit 4). In Europe and Brazil, the expansion has been mainly driven by wind plant's acquisitions, contrarily to what has been made in the US, where the company adopted a self development strategy. For the latter, EDP took advantage of partnerships with local investors that felt attracted by the company's business and performance.

EDP expansion can be considered a "multidomestic strategy", meaning that each foreign-country operations act independently in terms of activities' integration. The subsidiaries operate and market its electricity output in response to the local legal, political and economic environments.

In spite of having each country's activities decentralized, EDP Renováveis is in charge of supervising the EDP's renewable business as a whole, hence avoiding duplication of some corporate activities (e.g. management of suppliers' procurement, financing and risk hedging strategy). Also, this "supra-centralization" enables the company to take advantage of the interactive learning and global information share, which will ultimately increment the EDP's competitive superiority, leading the company to be, in 2008, the leader, amongst the five other leaders, in growth and expansion (See Exhibit 15).

2- *Why is the Renewable' energy industry so profitable for EDP?*

The analysis of the EDP's financial and operational outperformance in the renewable sector have to consider the specific characteristics and competitive advantages of EDP in this market, as well as the industry factors that were turning this business so attractive.

Beginning with the firm's competitive advantages, an "early mover" positioning in the markets where EDP Renováveis operated have to be first and foremost considered. The fact that the company moves into a specific country's energy market at an early stage, guarantees the better wind availability locations. Besides, it gives it better conditions to access the existing electricity grids connections, which have limited capacity. These two aspects ensure that, first, the ratio of the net amount of electricity generated by a power plant to the net amount which it could have

generated if it were operating at its net output capacity, will be considerably high, and second, that all of its electricity output will be drained and sold. Additionally, operating with first class assets also contributes to the achievement of these high load factors, considerably above the market average (See Exhibit 4.1.2.2).

Moreover, the fact that EDP Renováveis is focusing its internationalization and growth uniquely in wind energy capacity addition, allows the company to profit from specialization benefits and learning economies. Besides, scale economies are also a competitive advantage of the Portuguese renewable operator. The fact that it is spread amongst so many different regions with a great portfolio diffusion, gives EDP Renováveis the opportunity to benefit from better sales arrangements (e.g. quantity discounts) with the leading turbine suppliers that cover the supply for all the markets. These beneficial contracts would allow EDP Renováveis to position itself with a cost advantage, when comparing to smaller and local firms.

Having analyzed the EDP's competitive advantages that uphold the firm's supremacy and leadership position, the industry factors have also to be taken into consideration. The Porter's five forces analysis allows determining what the main sources of profitability and attractiveness in this industry are.

As the majority of the industries, the renewable' industry is affected by the suppliers, intensity of rivalry, threat of new entrants, substitutes and buyers. However, the profitability of this industry is also highly affected by another factor: the regulatory authorities. These authorities build the legislation in light of giving incentives to invest in the renewable sector, establishing the pricing rules and course. Furthermore, they also play a role in the permits to have access to the electricity grids, as they seem to be insufficient, and its improvement and expansion will also depend on governmental investments.

Bargaining power of buyers:

As a renewable power source, wind is highly influenced by legislation. All special regime production, i.e. all the electricity produced from renewable sources, is unavoidably purchased by the system, and thus the renewable energy producers have the guarantee that they will be able to sell everything they produced. Furthermore, prices can be regulated (fixed tariff or market price plus premiums with floor and cap) or non-regulated (subject to electricity market prices). As so, the market price for which the producers sell their output will depend on the type of contract the producers have with its buyers; if the prices are non-regulated, the electricity producers have to sell its output at prices indexed to the volatile market, not guaranteeing good conditions when the electricity price falls. However, this situation can be avoided if the electricity producers chose to sell its output at regulated prices: they do not take advantage of the rise in raw materials, but they do control their profitability.

The buyers' role in this industry is played by the government, as it is the responsible for the buying incentives of the output. The extent to which the governmental regulations will continue to benefit the renewable energy activities, highly depends on the incentives the government has to continue to do so. To set these legislative measures aiming at boosting the renewable' sector, the government faces a trade-off between continue the investment incentives by paying higher prices for the renewable' energy output, and harming the other sectors that unavoidably have to buy the energy at an elevated price, thus boosting their production costs. As far as the regulatory framework is favorable to the renewable energy producers, the industry players will continue to benefit from high levels of profitability. However, the discontinuation of these incentives would severely harm the operating firms, leading to conclude that the producers have few bargaining power when facing the buyers' side, represented by the legislation that imposes the selling rules.

Threat of new entrants:

The threat of new entrants has to be analysed in the short and in the long-term, as the conditions are expected to be different.

Being a capital-intensive industry that requires huge amounts of capital to invest, it is not certain that new entrants will appear massively in the renewable sector in the short-term, when facing credit constraints caused by the current financial crisis. Furthermore, to have new entrants, the market has to have “space” to receive more firms, and there is currently capacity grid connection limitations, making the market easily saturated and concentrated in the “early mover” and local players. Thus, the threat of new entrants is quite low in the short-term.

In the long-run, this scenario might change. As the governments, namely the US government, are channeling attention and money to improve electricity grid connections to continue incentivizing the investment in the renewable sector, the “required” space in the market place for new firms is about to increase. Additionally, as in the long-term the financial situation is expected to be normalized, the access to capital financing would be eased and more firms would have conditions to initiate operations. Ultimately, as the regulatory incentives are not expected to discontinue, the threat of new entrants in the long-term is expected to be considerably high.

Threat of substitutes:

Concerns regarding climate change and increased energy dependence from politically unstable economies led to a stronger support from governments to invest in renewable energies either through price, quantity or tax-related incentives. In fact, wind, as a pollution-free, sustainable and cost-efficient form of energy, has proven to be the closest to fossil fuels in terms of competitiveness, thus receiving governmental support to continue and boost the activities.

As far as other carbon-free technologies are concerned, the nuclear power and hydrogen are not that threaten to the wind power industry; nuclear generation is considered to be dangerous and problematic, especially due to its waste, alongside with extremely high construction costs, large

time-to-market and low operation lifetime. Hydrogen has proven to be an inefficient process, as it is necessary to spend lots of energy to separate the associated elements to get the hydrogen, making the final production lower than it would be ideal.

Again, the regulatory incentives play a crucial role in this industry force. As far as the renewables, namely the wind power, demonstrates to be harmless and the most sustainable option as an energy source, facing the other alternatives, the governments are expected to continue incentivizing this sector development. However, if in the future other energy sources, namely the nuclear and hydrogen, turn out to be more efficient, safe and economically more viable, the jurisdiction is expected to turn its attention to these new forms of energy generation, leaving the renewable' in a risky situation.

Bargaining power of suppliers

The fact that there are a limited number of wind turbine suppliers, makes the market be quite concentrated and allow turbine suppliers to exert a certain market power and keep the market prices above what would be expected in a less concentrated market. However, the number of suppliers is not low enough to capture all the bargaining power, and the demand side encountered means to capture significant value in the negotiations. The larger players (in opposite of small/local players) can benefit from sales arrangement with its suppliers by signing long-term and flexible contracts covering several regions. These contracts do not allow changes in its conditions within the contract validity, mitigating the risk of wind turbines' prices increases. However, these long-term agreements do not permit a wind turbine buyer to take advantage of the price decreases either, which leads the supply side better-off. In such situations the buyers are being heavily impaired, as 75% of its capital expenditures are driven by the cost of wind turbines. As a result, larger buyers, within flexible contracts, have the possibility to renegotiate dealing conditions with the suppliers to take advantage of eventual price falls.

Facing few wind turbine suppliers and an increasing trend to invest in the renewable sector, will ultimately benefit the supply side, thus improving the conditions to increase its relative bargaining power. However, this industry force would also depend on the size of the renewable' operators, fluctuations in turbine's raw materials prices, contracts' clauses, etc.

Rivalry:

The internal rivalry has to be evaluated between larger firms and small/local firms, and within the large firms group. As far as rivalry between large and small firms is concerned, credit facilities, sales arrangement with suppliers and technical competences have to be taken into account. These characteristics give considerable competitive advantage to the larger firms and are likely to accelerate the sector's concentration process leading to less competition for turbines, sites, etc., in the medium/long-term. However, as the electricity grid interconnections have capacity constraints, first movers and local firms have a competitive advantage in ensuring that its energy generated will enter the electricity grid, thus contributing to improve the conditions to establish comfortable market shares. The access to the electricity grid is the major source of rivalry in this industry, and hence, the governments are committed to diminish the current grid interconnections limitations to make it easier to increase the share of renewable in the energy mix in the future. The rivalry intensity alleviation will, again, depend on the governments' willingness to improve and expand the connections between renewables' facilities and urban areas.

The profitability of the Industry

Given the information gathered by analysing the Porter's five forces regarding the renewable' industry, one can now state that this is, in fact, an industry highly dependent on a transversal sixth force: the governmental incentives. This factor will then affect the other five forces, excepting the suppliers bargaining power. As one could see, buyers' bargaining power, threat of new entrants, threat of substitutes and rivalry intensity are all highly influenced by

legislation, and if the governmental incentives continue to exist, the profitability of this industry is expected to continue being high and secured. Nonetheless, if those incentives cease, the industry's profitability would be severely harmed: there would be no good pricing conditions anymore, the selling of the output volume would be not guaranteed, the connections between wind farms and urban regions would continue to be scarce (increasing the rivalry intensity), and other forms of energy generation would then capture all this attention, stealing the wind producers' business.

3- Given EDP's growth and expansion strategy, what are the main threats that the company faces and what can EDP Renováveis do to deal with them?

As the responsible subsidiary for the expansion and internationalization of EDP Group via renewable energies, EDP Renováveis' business is focused on the production of electricity from renewable energy sources, especially wind. As the main opportunity in this industry is built essentially on the regulatory incentives, it seems obvious that the main threat would be its discontinuation in the future. This can happen if, for instance, some other type of energy source turned out to be more efficient and competitive than the current renewable'. If this happens, besides not having the guarantee to sell its complete output production and favorable pricing conditions, the wind plant owners would keep its wind turbines until its operational lifetime is over (about 20 years). During these 20 years of operations, the renewable players would have to support O&M contracts and other fixed costs associated with the production of this type of energy, which in face with an unfavorable regulatory framework could financially harm the operating firms.

Nonetheless, both the European Union and US bodies have reaffirmed their desire to continue and strengthen such support, at least for the mid-term. However, it cannot be guaranteed, and

that is why competing internationally gives EDP Renováveis the possibility to hedge this regulatory risk, as the authorities in one country are not perfectly correlated with another's.

Besides supporting incentives to invest in the renewable sector, international, national, state, regional and local regulation relating to the development of wind farms, also rule the construction, licensing and operation of power plants. If the relevant authorities in the jurisdictions in which EDP Renováveis operates fail to continue supporting, or reduce their support in the development of wind plants, such actions could have material adverse effects on the business. However, the presence in a variety of geographies helps EDP Renováveis to mitigate this risk, as the authorities of the markets in which EDP Renováveis operates are not the same and are not correlated at all.

Besides regulatory incentives and its importance to the firms' performance, the energy production volume and the resultant operational efficiency also depend on weather conditions and wind availability, which vary across the regions. Hence, to offset wind variations, EDP Renováveis invested in the geographical diversification of its wind farms to keep the total energy generation relatively stable. Moreover, the remuneration for electricity generated by EDP Renováveis' wind farms depends, also and in part, on market prices for electricity. As they are affected by numerous factors, market prices are somewhat volatile, and when they suffer a decline, substantial adverse effects rise for EDP Renováveis. Hence, the Portuguese renewable operator uses hedging policies concerning market price risk in order to reduce the exposure to volatile electricity prices: 70% of its installed capacity have no exposure at all to energy price fluctuations, 8% has a limited exposure, and only 22% exposed to the market price trends, which may benefit the EDP Renováveis when the prices go up for some external reason.

Besides profitability, the capability to finance wind projects is also critical for the company's activity. As EDP Renováveis operates in a capital intensive industry, large amounts of capital are necessary to finance its investments. As so, the company is partially exposed to interest rates variations through the financing, in particular, shareholder and non-shareholder loans from the

EDP Group and from institutional investors. However, to ensure its upcoming profitability by protecting itself from uncertain circumstances that may compromise its sustainable growth perspectives, the company has to make use of some risk management policies. These internal procedures aim to reduce the financial charges and its exposure of debt cash flows from market oscillations. An example would be contracts of interest-rate derivative financial instruments to hedge cash flows associated with future interest payments, which have the effect of converting volatile interest rate loans into fixed interest rate loans.

In addition to the interest rate risk, EDP, as it operates internationally through EDP Renováveis, is also exposed to the exchange-rate risk resulting from investments in subsidiaries whose currency is not the *euro*. Once more, there are risk management procedures that monitor the evolution of the foreigner currencies, for instance the US dollar, seeking to alleviate the impact of currency fluctuations on the financial results of the Group. One example would be undertaking derivative financial instruments for the hedging of foreign exchange-rate risk.

Concerning wind plants development and effectiveness, the purchase of wind turbines is a huge investment in terms of capital expenditure (around 75%), and if its performance is not adequate, the profitability of these wind turbines will be lower than the expectable. EDP Renováveis mitigates wind turbine performance risk by using a mix of top tier turbine suppliers which minimizes technological risk. Additionally, wind turbine performance risk is reduced by signing strict and thorough O&M contracts with suppliers with technical warranties, in order to guarantee that the performance of the turbine will be optimal. Furthermore, wind turbines purchase face price risk and quantity risk. The price risk takes place when the supply cannot meet the growing demand of wind turbines, and prices rise harshly, shocking the profitability of new wind farms. The quantity risk arises when no wind turbines are available for the construction of further wind plants, which happens with demand booms that can be driven by the increase incentives to invest in this sector or by improvements in the electric grid connections. In response, EDP Renováveis has shifted from national and project-driven agreements, to long-term agreements covering

several regions. These agreements enable EDP Renováveis to have turbines available when needed, but, on the other hand, they could prevent the company to take advantage of turbine prices' drop, when they occur. For this reason, EDP Renováveis is renegotiating agreements, as well as dealing more flexible agreements for the next years.

4- *Given the perspectives for the development of this industry, how should EDP position itself for the future?*

Presenting a Strategic Plan for the period 2009-2012 that channels two thirds of its investment to EDP Renováveis, EDP Group's future seems to be closely tied to the success of this company. Furthermore, by sharing the use of the "EDP" trademark, brand name and logo, it is created not only a way for EDP Renováveis to distinguish its services from those of its competitors, but also a close connection between both companies, where EDP largely benefits from EDP Renováveis great expansion throughout the world, as its brand recognition will be globally spread. So, it only makes sense for EDP to continue providing both financial and R&D and Innovation support to EDP Renováveis' efforts to continuously expand in a sustainable manner.

EDP Renováveis already proved to have several strengths that provide it with advantages over its competitors, both in terms of the ability to consolidate and strengthen its position in its existing markets, and enter into and integrate its operations in new geographies. The competitive superiority is, firstly, due to the "early mover" advantage that favors the choice of suitable wind availability sites and access to electric grid connections. Moreover, the fact that the company expanded abruptly mainly through wind power capacity, will enable EDP Renováveis to profit from scale economies in the learning and experiencing process and, expectably, also in the suppliers' contracts. These scale economies, besides lowering the input cost, would ultimately benefit the operationalization, justifying the above the market average load factors experienced by EDP Renováveis (See Exhibit 4.1.2.2).

For the years that follow, EDP Renováveis intends to consolidate its position as a top worldwide company in the renewable energies sector and develop a sound and diversified portfolio, by focusing on execution of current investment plans, on efficiency and on further growth. The latter is accomplished through a “selective growth strategy”, increasing capacity in the countries where it is currently operating and entering a selective group of new high potential markets and of other renewable technologies (hydroelectric, off-shore wind, wave, solar).

Though, the exposure to the renewable sector with a strong long-term outlook is based on concrete manifestations of favorable renewable energy market conditions for the future. If the future regulatory perspectives were not reasonably safe, further investment in a high capital-intensive industry would be a huge risk. Both in Europe and North America the favorable regulation, at least for the next years, is quite secured; in Europe, the European Commission published targets comprising the coming years, where the increase of renewable’ energy in the energy mix is the main focus. In the United States there is a strong political support for the extension of the current regulatory and tax incentives framework, and the channelizing of the attention in the improvement of the electricity grid connections.